



CITY COUNCIL

AGENDA REQUEST

AGENDA OF:	10-19-10	AGENDA REQUEST NO:	III-C
INITIATED BY:	TIMOTHY JAHN P.E., ENGINEER IV	RESPONSIBLE DEPARTMENT:	UTILITIES
PRESENTED BY:	SUELLEN STAGGS, DIRECTOR OF UTILITIES	DEPARTMENT HEAD:	SUELLEN STAGGS, DIRECTOR OF UTILITIES <i>SS</i>
		ADDITIONAL DEPARTMENT HEAD (S):	CHRISTOPHER STEUBING, P.E. CITY ENGINEER <i>CS</i>

SUBJECT / PROCEEDING: **WASTEWATER MASTER PLAN UPDATE – CIP NO. WW1104 AUTHORIZE ENGINEERING SERVICES CONTRACT WITH HDR ENGINEERING, INC. AND APPROVE BUDGET REALLOCATION FROM WW0905**

EXHIBITS: **ENGINEERING CONTRACT COVER PAGE SCOPE AND FEE**

CLEARANCES	APPROVAL
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LEGAL:	JOE MORRIS, CITY ATTORNEY <i>JCM</i>	EXECUTIVE DIRECTOR:	N/A
PURCHASING:	TODD REED, PURCHASING MANAGER <i>(P)</i>	ASST. CITY MANAGER:	KAREN DALY <i>kd</i>
BUDGET:	JENNIFER BROWN <i>JB</i> BUDGET & RESEARCH DIRECTOR	CITY MANAGER:	ALLEN BOGARD <i>kd</i> FOR AB

BUDGET

EXPENDITURE REQUIRED: \$	198,560
CURRENT BUDGET: \$	165,000 WW1104 \$33,560 FROM WW0905
ADDITIONAL FUNDING: \$	N/A

RECOMMENDED ACTION

Authorize execution of an engineering services contract between the City of Sugar Land and HDR Engineering, Inc. for the Wastewater Master Plan Update 2011 Project CIP WW1104, in a maximum amount of \$198,560 and approve a budget reallocation of \$33,560 from WW0905.

EXECUTIVE SUMMARY

The City's Wastewater Master Plan was last updated in 2004 and a mini-update was conducted in 2007. The City's comprehensive plan recommends all master plans be updated every five years and due to recent and upcoming development, a major wastewater system master plan update is warranted.

The purpose of this Wastewater Master Plan update is to assist in developing a phased Capital Improvement Program (CIP) focused on insuring adequate system capacity is available to serve new development in the City and extra-territorial jurisdiction (ETJ) along with planning for regional systems or anticipated growth beyond current plans. The City's wastewater collection system capacity and wastewater treatment capacity will be evaluated and improvements to the systems will be identified and recommended.

HDR Engineering, Inc. was selected for this project following the City's policy for procurement of professional services. The Utilities and Engineering Departments coordinated efforts to evaluate and to recommend the most qualified firm based on experience and knowledge of the City's wastewater system. HDR Engineering, Inc. is currently completing a Preliminary Engineering Report (PER) for the City's Sanitary Sewer Evaluation and City staff are satisfied with their performance.

Scope of services for this phase will include collecting, reviewing and organizing current data, updating development and demand projections, updating the wastewater system maps, evaluating wastewater treatment capacity, analyzing wastewater collection system, and generating a wastewater collection system model using SewerCAD software. Other tasks will include incorporating previous and ongoing wastewater studies into the final report so that the wastewater master plan will be a complete, comprehensive update. After Notice to Proceed is given, the project is expected to take about ten months to complete.

The original project scope did not include the Sewer CAD modeling component which caused the cost of the master plan to exceed the budget. The wastewater collection system model will be used to determine if adequate capacity is available during the master plan process and will also be a tool for Utilities staff to use in the future when development density assumptions change. Allowing City staff to complete this type of analysis rather than relying on and paying outside consultant for the work will be more efficient and cost effective long term.

The required budget for this scope is \$198,560 of which a portion is available in CIP WW1104 (\$165,000) and a portion is in CIP WW0905 (\$33,560). CIP WW0905 (Lift Station Rehabilitation – Sugar Creek, Lombardy, and 7th Street lift stations) has excess funds due to lower-than-expected construction costs from recently received bids. Staff recommends transfer of available excess funds from WW0905 to WW1104.

The Utilities Department recommends that the City Council authorize the execution of an engineering services contract with HDR Engineering, Inc. for the Wastewater Master Plan Update CIP WW1104, in a maximum amount of \$198,560.

EXHIBITS



September 24, 2010

Mrs. SuEllen Staggs
Director of Utilities
City of Sugar Land
2700 Town Center Blvd. N.
Sugar Land, Texas 77479

Re: 2011 Wastewater Master Plan Update
City of Sugar Land

Dear Mrs. Staggs:

HDR Engineering Inc. hereinafter referred to as HDR|Claunch & Miller (C&M) is pleased to submit this proposal for performing engineering services for the 2011 Wastewater Master Plan Update. The proposal is based on our understanding of the project as discussed in our previous meetings and conversations. For your convenience, this proposal consists of Project Overview, Scope of Services, and Fee.

PROJECT OVERVIEW

This project will update the City of Sugar Land's Wastewater Utility Master Plan for the year 2011. The primary tasks involve reviewing and updating existing development and demand data, developing future capacity requirements, identifying system deficiencies, evaluating treatment alternatives, and developing a phased Capital Improvements Program to upgrade the collection and treatment system. The City of Sugar Land's wastewater collection system consists of approximately 325 miles of sewer pipe ranging in diameter from 6-inches thru 48-inches diameter, 105 lift stations, and two wastewater treatment plants. The project also includes master planning for all ETJ areas north of the Brazos River, and the RiverPark subdivisions located north of US Highway 59. The remaining ETJ areas are part of a wastewater planning study being performed by Brown & Gay Engineers. The results and findings of the Brown & Gay study will be incorporated into the final master plan report document.

SCOPE OF SERVICES

Task 1 – Collect, Review and Organize Data

C&M will compile and review relevant data provided by the City and in C&M's possession, including existing Master Plans, recent studies including the existing wastewater system maps, treatment capacity, lift station capacities, land use planning documents and other studies and reports pertaining to existing and future conditions that may impact the City of Sugar Land's

wastewater system. This will include data pertaining to the City of Sugar Land, New Territory, River Park, Riverstone, and all other ETJ areas north of the Brazos River. The RiverPark wastewater system analysis completed by others in July 2010 will be included in this report.

Task 2 – Update Development & Demand Projections

The City Planning Department will provide C&M the most current City planning data, such as designated Planning Area boundaries and Planning Area population/development projections. Existing development projections for the relevant service areas will be updated based on information provided by the City planning staff and discussions on anticipated timing for development in different part of the City. Wastewater demand projection updates (low, medium, and high growth assumptions) will be completed based on individual planning areas for planning periods of 5, 10 and 20 years. Available treatment plant flows and wastewater demand data will be provided by the City and used to update the expected equivalent single-family connection (ESFC) demand.

Task 3 – Update Wastewater System Map

Upon review of as-built drawings and existing GIS databases, the Wastewater System Map will be updated to reflect changes since the previous update and changes/updates requested by City staff. The updated system map will reflect utilities that have been constructed since the previous Master Plan update and will depict graphically the following information:

- Wastewater treatment plant services areas
- Gravity line service and subservice areas
- Lift station service and subservice areas

Electronic copies of the system map will be delivered to the City for future use. System maps will serve as the basis for evaluating the ability of existing infrastructure to meet projected demands and the feasibility of system-wide improvements. Deliverables will include:

- An electronic GIS Database of the updated Wastewater System Map
- A hard-copy map of the overall Wastewater Collection System Map
- An Adobe .pdf file of the overall Wastewater System Collection System Map

Task 4 – Wastewater Treatment Capacity

Daily wastewater flow data and rainfall data provided by the City will be used to develop and

refine factors for historic average daily flow, inflow / infiltration, and peak flows experienced at the North Wastewater Treatment Plant (North WWTP), South Wastewater Treatment Plant (South WWTP), the and West WWTP at New Territory. These factors will serve as the basis for updates to the design criteria for the treatment and collection system. Based on an evaluation of existing treatment capacity, alternatives for location of additional treatment capacity and expansion of existing facilities will be developed. These alternatives will take into consideration the impact on the collection system improvements that may be required. The location of any additional treatment facilities for expansions will take into consideration the need to minimize the cost of conveyance. A proposed schedule to meet additional capacity requirements for each alternative (based on high growth demand projections from Task 2) will be developed. This task will include a summary of the general condition of the major treatment components of the existing treatment facilities, based on a site visit to each plant. A structural evaluation is not included.

Task 5 – Wastewater Collection System Analysis

Based in information from Tasks 1 through 4, the existing capacities of the major collection system components will be established and projected capacity requirements will be calculated. The existing approximate capacity of the lift stations will be verified based on available field data, previous studies, and interviews with Operational personnel. The ability of the lift stations to handle the projected flows and the required expansion will be determined. Recommendations for new trunk sewer lines will take into consideration constructability, construction costs, and potential environmental impacts. A list of recommended system improvements and associated schedule will be developed.

Task 6 – Wastewater Collection System Model

Based on information from Tasks 1 through 5, the existing wastewater collection system will be modeled using Bentley SewerCAD modeling software. Existing and future flow conditions established from Task 2 will be used to model projected flows and system capacity. Facilities and pipelines requiring expansion from Task 5 analysis will be confirmed through modeling efforts. The following is a summary of the modeling tasks to be performed:

- Import the updated GIS wastewater collection system map into the modeling software.
- Create a geo-referenced wastewater system model for all sanitary sewer gravity mains 12-inches in diameter and greater, any size gravity line directly connected to a lift station, and any smaller wastewater lines that need further analysis due to capacity issues on a case-by case basis.
- Include in the model basic data for each lift station. The lift station models will

include the parameters of: overall capacity and wet well basin storage volume. The operation of individual pumps and level controls is not included, as this level of study would be reserved for future design-phase or trouble-shooting analyses.

- Include in the model the force mains serving each lift station.
- The flow data utilized in the model will be based on the number of equivalent wastewater service connections to estimate average daily flow. For wet weather flows, a common "peaking factor" will be applied to the average daily flow. This is in contrast to utilizing "measured" wastewater flows and calculated "actual" peaking factors unique to each of the lift station service areas. This can be added to the model in the future as a refinement.
- The model will include representations of the recommended improvements.
- The flow line elevations utilized in the model will be based on the best available data. The scope of work does not include field measurements or surveying to determine flow line elevations or ground elevations. Sewer flow line and surface elevations will be estimated based on: As-Built drawings; LIDAR topographic information; contour maps; GIS data on manhole measure-down depths; and TCEQ minimum grade and assumed elevations when no other information is available.

Task 7 – Coordination/Review/Inclusion of the Greatwood/South of the Brazos Wastewater Study

The wastewater system study currently underway by others for areas south of the Brazos River (Greatwood and ETJ) will be coordinated, reviewed, and included in this 2011 Wastewater Master Plan Update. Detailed efforts for this task are as follows:

- Coordination will include interfacing with the City's consultant for the study as to timing of completion of Greatwood/South of the Brazos Wastewater Study;
- cursory review of the report/recommendation for general soundness and note any apparent discrepancies;
- Include recommendations of the Greatwood/South of the Brazos Study formatted into the 2011 Wastewater Master Plan Update tables and text;
- Include a paper copy of the Greatwood/South of the Brazos Study as an appendix into the 2011 Wastewater Master Plan Update

Task 8 – Inclusion of the RiverPark Wastewater System Analysis Study

The report of RiverPark wastewater system analysis prepared by others in July 2010 will be included as an appendix into the 2011 Wastewater Master Plan Update. No coordination or review will be required and City staff will provide copies of the report.

Task 9 – Prioritization of Recommendations & Cost Estimation

Prioritization of recommendations will be based on the need for collection and treatment system upgrades to relieve existing system capacity deficiencies and to provide services for anticipated new development. A phasing plan for the Capital Improvement projects in terms of a 5-year and 10-year CIP will be developed. Budgetary engineer's estimate of probable construction costs will be developed to assist the City in the implementation of the CIP.

Task 10 – Prepare Final Report and Present to City Council

A Final Wastewater Utility Master Plan Report presenting the results of Tasks 1 – 8 will be deliverable at the end of the project. Upon incorporating the City's comments, C&M will also develop a presentation to the City Council summarizing the key elements of the Master Plan. Completed copies of the Report will be submitted in electronic format including Excel, Word, GIS, and PDF files. Deliverables include:

- Four (4) draft copies of the Wastewater Master Plan report for City review.
- Twenty (20) final copies of the Wastewater Master Plan.
- A CD containing electronic copies of information/files/data included in the Final Wastewater Master Plan.

PROJECT SCHEDULE

It is anticipated that the total time from authorization to completion of the project will be approximately ten (10) months. This schedule includes the presentation of the Wastewater Master Plan to City Council, projected to occur during October of 2011.

FEE

The proposed fee for the above-described scope of services to perform the Wastewater Master Plan Update is as follows:

Wastewater Master Plan Update (Includes Tasks 1 Through 10 except Task 6 Modeling): The Lump Sum Amount of:	\$156,340.00
Wastewater System Modeling (Task 6) The Lump Sum Amount of:	\$36,220.00
Reproduction of Reports: (Cost plus 10% budgetary amount):	<u>\$ 6,000.00</u>
TOTAL FEE:	\$198,560.00

HDR|Claunch & Miller will submit monthly progress invoices for all engineering work completed to invoice date. The invoices would be based on a percentage of the lump sum fee. All hourly charges shall be charged based on a raw labor rate times a multiplier of 3.05, reimbursable expenses will be charged at cost plus 10%. Mileage will be charged at the current published IRS rate.

Additional Services

Additional services will be invoiced on the basis of direct labor cost times a factor of 3.05 and direct cost plus 10%. No additional services will be performed or invoiced without prior authorization from the City of Sugar Land.

We sincerely appreciate the opportunity to submit this proposal and we look forward to continuing our work with the City of Sugar Land.

Sincerely,
HDR|CLAUNCH & MILLER



Madhu Kilambi, P.E.
Vice President